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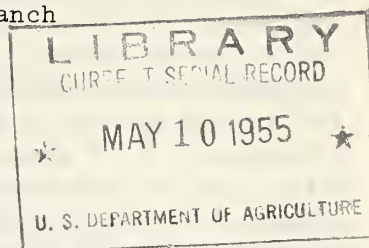
UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
UTILIZATION RESEARCH

LIST OF PUBLICATIONS AND PATENTS

of the  
Northern Utilization Research Branch  
Peoria, Illinois

July - December 1953

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PUBLICATIONS

[Publications marked (\*) are not available for distribution]

WHY THE EMPHASIS ON CORNCOB.

T. F. Clark and J. W. Ashbrook.

Chemurg. Digest 12(6-7): 9-10. June-July 1953.

The significance of corncobs in meeting some of the agricultural and industrial needs of the increasing population is pointed out. Factors, such as availability and the chemical and physical characteristics, that influence the production and use of cob products, are discussed. The relationship of corncobs to the production of feedstuffs is shown.

MICROANALYSIS OF ORGANIC SALTS BY THE USE OF CATION EXCHANGE RESINS.

Cecil H. VanEtten and Mary B. Wiele.

Analyt. Chem. 25(7): 1109-1111. July 1953.

The ability of unfunctional, high-capacity, synthetic resins to quantitatively exchange hydrogen ions for metallic or organic cations suggested their use for the determination of organic salts on a microscale. Successful analyses of 46 salts of organic acids or bases are reported. The accuracy and precision of the method are indicated by an average recovery of 99.87 percent, with a standard deviation of 0.21 percent, on 20 determinations of a sample of pure sodium oxalate. Results are expressed as "exchange equivalent." The method offers the advantages of speed, simplicity, and accuracy over the conventional micromethods for determining organic salts.

SYNTHETIC LUBRICANTS FROM HYDROXYSTEARIC ACIDS.

H. M. Teeter, L. E. Gast, E. W. Bell, and J. C. Cowan.

Indus. and Engin. Chem. 45(8): 1777-1779. August 1953.

Several new compounds of interest as synthetic lubricants are described. These compounds are diesters of 9(10)- or 12-hydroxystearic acid, and have pour points ranging from -4° to -63° F., viscosity indices from 96 to 155 and ASIM slopes from 0.682 to 0.753.

#### ACETOBROMINOLYSIS OF DI- AND POLYSACCHARIDE ACETATES.

Allene Jeanes, C. A. Wilham, and G. E. Hilbert.

Jour. Amer. Chem. Soc. 75(15): 3667-3673. August 5 1953.

For use in structural studies on amylaceous polysaccharides and their products of acid and enzymic degradation, a rapid chemical method was sought for differentiating the non-1,4 linkages believed to occur at branch points, from the predominant  $\alpha$ -1,4-linkages. This objective was achieved through establishment of a polarimetric method based on the reaction of the polysaccharide triacetates with a mixture of hydrogen bromide in acetic acid and acetyl bromide. The end rotations of these reaction mixtures were inversely proportional to the percentage of non-1,4-linkages in the polysaccharides. These non-1,4-linkages appeared to be mainly  $\alpha$ -1,6-. The triacetates of dextrans, which have predominantly  $\alpha$ -1,6-glucopyranosidic linkages and varying proportions of  $\alpha$ -1,4 and/or  $\alpha$ -1,3-, gave end rotations with this reagent in inverse proportion to the content of 1,6-linkages. In keeping with the results on the polysaccharide acetates, 1,4- and 1,6-glucopyranosidically linked disaccharide acetates gave strikingly different results with this reagent. The causes for these differences were determined.

#### FRACTION COLLECTOR WITH CONTINUOUSLY ROTATING TURNTABLE AND IMPROVED RECEIVER ASSEMBLIES.

R. J. Dimler, J. W. Van Cleve, Edna M. Montgomery, L. R. Bair, F. J. Castle, and J. A. Whitehead.

Analyt. Chem. 25(9): 1428-1430. September 1953.

A relatively inexpensive fraction collector of simple design is described. Details are given for the driving mechanism (synchronous motor and gear box, coupled through change gears), two turntables and two distributor-receiver assemblies. The apparatus has been used successfully with large chromatographic columns of cellulose and of carbon from which about 2 to 4 liters of effluent were collected per revolution of the turntable (7 to 24 hours), with fraction volumes of about 10 to 50 ml. each (reproducible within about 2 to 10 percent).

#### PHOTOELECTRIC VOLUME-MEASURING ACCESSORY.

Herbert J. Dutton and Francis J. Castle.

Analyt. Chem. 25(9): 1427-1428. September 1953.

There are frequent occasions when fractions of specified volume between 5 and 20 ml. need to be collected automatically. In many instances of chromatography, distillation, and liquid-liquid extraction rates of flow may vary too greatly to permit the use of "time-flow" mechanisms or may be too rapid for drop-counting mechanisms. A photoelectric volume-measuring accessory is described which may be assembled from parts readily available or constructed in most laboratories. A "plug in" method of connecting this device to a commercially available collector is indicated, the principle of operation, however, should have general applicability.

#### SUGAR OXIDATION. SACCHARIC AND OXALIC ACIDS BY THE NITRIC ACID OXIDATION OF DEXTROSE.

C. L. Mehlretter and C. E. Rist.

Jour. Agr. and Food. Chem. 1(12): 779-783. September 2, 1953.

As part of a program for the extended utilization of products from corn, a systematic study of the preparation of saccharic acid by the nitric acid oxidation of corn sugar was made. The effect of such factors as the concentration of nitric acid, the ratio of



nitric acid to dextrose, time of oxidation, and temperature of the reaction on the yield of saccharic acid was investigated in detail. Oxidation of 1 mole of dextrose with 4 moles of 60-70 percent nitric acid at a temperature of 55°-75° C. over a period of 1 hour produced an average yield of 41 percent of potassium acid saccharate. The byproduct sugar acids formed can be further oxidized with nitric acid in the presence of vanadium catalyst to produce oxalic acid in a yield of 44 percent of theory. Saccharic acid and its derivatives have potential use as food acids and as sequestrants in cleaning composition.

#### FEED EVALUATION--DETERMINATION OF ABSORPTION CAPACITY AND FIBROUS MATERIAL OF PITH AND CERTAIN FEED CONSTITUENTS.

T. R. Naffziger and H. I. Mahon.

Jour. Agr. and Food Chem. 1(13): 847-851. September 16, 1953.

Procedures for evaluating the absorption capacity and the particle-size distribution of pith and certain feed constituents are described. Absorption capacity is determined by noting the amount of water taken up by the capillary action of air dry cellulosic material. Particle-size distribution is determined by subjecting a water suspension of the material to fractionation in the Bauer-McNett classifier.

#### THE ASCOSPORIC STAGE OF *ASPERGILLUS CITRISPORUS* AND RELATED FORMS.

Kenneth B. Raper, Dorothy I. Fennell, and Homer D. Tresner.

Mycologia 45(5): 671-692. September-October 1953.

Two years ago an ascosporic species of *Aspergillus* was isolated by a graduate student at the University of Wisconsin. Following its submission to us for diagnosis, it was found to represent an ascosporic species of *Aspergillus* which was previously unreported. Because of the conspicuous ornamentation of its ascospores the form has been described as a new species, *A. ornatus* n. sp. It is regarded as closely related to *A. citrosporus* Von Höhnelt, but differs from this long-recognized species in producing ascospores of very different pattern.

#### THE FLAVOR PROBLEM OF SOYBEAN OIL. XIII. SULFUR COORDINATION COMPOUNDS EFFECTIVE IN EDIBLE OIL STABILIZATION.

A. W. Schwab, Helen A. Moser, Rosemary S. Gurley, and C. D. Evans.

Jour. Amer. Oil Chem. Soc. 30(10): 413-417. October 1953.

A series of sulfur compounds have been investigated, and the types of molecular structures found effective for metal chelation are discussed. Sulfur is one of the best coordinating atoms for heavy metals. The addition of carboxymethylmercapto succinic acid reduced peroxide development in edible soybean oil to 1/80 of that of the control oil. Oxidation and organoleptic results are reported showing the effects of the thio acids, sulfonic acids, sulfur dioxide, sulfuric, sulfur, and hydrogen sulfide.

#### CHEMISTRY OF BROWNING REACTIONS IN MODEL SYSTEMS.

John E. Hodge.

Jour. Agr. and Food Chem. 1(15): 928-943. October 14, 1953.

The recent researches of the author and others have provided the basis for an integration of the several partial theories of nonenzymatic browning heretofore proposed. The significance of the occurrence of the Amadori rearrangement and the subsequent formation of reductones in the Maillard reaction is stressed, and a mechanism for browning in sugar amine systems based on the Amadori rearrangement is outlined. Investigations of browning

reactions in model systems published during the last three years are reviewed, together with the pertinent older studies, and the results of most of these are shown to fit into the proposed scheme of reactions. A classified directory to a total of 196 references on browning in nitrogenous model systems (1940 to March 1953) is included.

#### POLYSACCHARIDE ARYL CARBAMATES. III. TRICARBANILATES OF POLYGLUCOSANS WITH VARIOUS GLUCOSIDIC LINKAGES.

Ivan A. Wolff, Paul R. Watson, and Carl E. Rist.

Jour. Amer. Chem. Soc. 75(20): 4897-4899. October 20, 1953.

Tricarbanilates were prepared from water-soluble sweet corn polysaccharides No. 1 and No. 2, glycogen  $\beta$ -amylase limit dextrin, the polysaccharide formed by *Phytomonas tumefaciens*, laminarin, yeast polyglucosan, cellulose, lichenin, and several selected types of dextrans. Relations between the structures of these polysaccharides and the optical rotations of their tricarbanilates are discussed. The various classes of polysaccharide carbanilates prepared had optical rotations in pyridine and morpholine which were dependent on the position and anomeric type of the predominant glucosidic linkages. This observation may prove useful in studies of the chemical structures of various polyglucosans.

#### \*A STUDY OF THE CLEANING OF CORN PLANNED AT THE NORTHERN REGIONAL RESEARCH LABORATORY.

Reid T. Milner.

Proceedings of the Annual Meeting, American Corn Millers' Federation, 105 West Adams, Chicago 3, Illinois, October 20, 1953.

A carefully supervised engineering study of present cleaning equipment in corn processing mills would show how it could be arranged and operated to give better results than some mills are now getting. The results of such a study and analysis of cleaning operations might lead to decided improvements in present cleaners and even to the design of entirely new cleaners. Secondly, a study of the physical and chemical properties of contaminating materials such as rat pellets and excreta should be of value to the entire milling industry in the operation and modification of present cleaners. The cleaning problem is of utmost importance to everyone milling corn--wet millers, dry millers, and all others making food products from corn.

#### CRUMB SOFTNESS FROM SOY FRACTIONS.

C. W. Ofelt, Allan K. Smith, and Paul A. Belter.

Food Tech. 7(11): 432-434. November 1953.

The effects of two soy products, (1) Gelsoy and (2) whey solids, on crumb firmness have been studied in the laboratory. Gelsoy has been used in a single commercial baking trial. Gelsoy (1 percent) doughs had handling qualities equal to doughs containing 0.5 percent POEMS, and the bread crumb was resilient in contrast to the crumb of bread containing POEMS. Both Gelsoy and whey solids cause a marked decrease in crumb firmness although not as great as that obtained with 0.5 percent POEMS. Use of 1 percent Gelsoy allows an increase in absorption of 1 percent and requires a small increase in oxidizing agent.

#### DETERMINATION OF DEXTRAN WITH ANTHRONE.

Troy A. Scott, Jr., and Eugene H. Melvin.

Analyt. Chem. 25(11): 1656-1661. November 1953.

The anthrone-method was used for the determination of concentration of dextran solutions. A study was made of the effects of the factors involved in the method and a procedure designed to improve the precision was evolved. Sources of error in the procedure were



analyzed and it was concluded that the most probable source of error is variation in the blank. Eighteen different chemicals at different levels of concentration were tested for their effects on the analysis. An estimation of the precision of the method was obtained by calculating standard deviations from 97 sets of duplicate blank determinations and 345 sets of duplicate sample determinations. The standard deviation for the samples, in optical density units, is 0.0029, corresponding to 0.48 percent at an optical density level of 0.600.

**\*PEROXIDES FROM AUTOXIDIZED METHYL OLEATE AND LINOLEATE AS INITIATORS IN THE PREPARATION OF BUTADIENE-STYRENE SYNTHETIC RUBBER.**

Daniel Swern, Joseph E. Coleman, H. B. Knight, K. T. Zilch, H. J. Dutton, J. C. Cowan, and J. M. Gyenge.

Jour. Polymer Sci. 11(5): 487-490. November 1953.

Hydroperoxides derived from methyl oleate and linoleate are compared with cumene and p-methane hydroperoxide as initiators in the preparation of butadiene-styrene synthetic rubber.

**PREPARATION AND SOME PROPERTIES OF HEMICELLULOSES FROM CORN HULLS.**

M. J. Wolf, M. M. MacMasters, John A. Cannon, E. C. Rosewall, and C. E. Rist.

Cereal Chem. 30(6): 451-470. November 1953.

Hemicellulosic material in yields of from 32 to 46 percent was extracted from several commercial and laboratory preparations of corn hull. The most satisfactory method of extraction developed was to solubilize the hemicelluloses by boiling the hull for 1 hour in sodium hydroxide solution at pH 10.5 to 11.5 and then to remove the hemicelluloses by repeated extraction with water. The hemicelluloses have a negative rotation ( $[\alpha]_D^{25}$  -81, c = 1.0, in water). The approximate composition of hemicelluloses from laboratory-separated pericarp was found to be 48 percent xylose, 35 percent arabinose, 7 percent galactose, and 8 percent uronic acid. The hemicelluloses were highly soluble in water to give homogeneous acidic solutions from light straw to brown in color. The solution viscosity was considerably higher than that of gum arabic but lower than that of several other vegetable gums, including karaya and tragacanth. It is suggested that corn-hull hemicelluloses might prove industrially useful as adhesives and thickeners.

**RESEARCH DEVELOPMENTS AT THE NORTHERN REGIONAL RESEARCH LABORATORY.**

John C. Cowan.

Soybean Digest 14(1): 14-16. November 1953.

This is a review of the research developments at the Northern Regional Research Laboratory during fiscal year 1952-1953 on Gelsoy, soy flour, and global edible spread. These items are mentioned since it was thought that they would be of most interest and might have some effect on the utilization of soybeans in the future.

**CARBOHYDRATE COMPOSITION OF HYDROL.**

Edna M. Montgomery and F. B. Weakley.

Jour. Assoc. Off. Agr. Chem. 36(4): 1096-1108. November 15, 1953.

Hydrol, a carbohydrate-rich stock feed supplement, occurs as a byproduct in the manufacture of crystalline dextrose. Hydrol contains about 35 percent of noncarbohydrate materials. The carbohydrate content, about 65 percent, has been established with the aid of standard analytical methods, chromatographic techniques, carbohydrate isolation characterization, and physical measurements. The carbohydrate moiety is a mixture of

62.5 percent dextrose, 29 percent disaccharides, and 8 percent of higher oligosaccharides. The biose linkages found in the 4 isolated disaccharides (D glucose polymers) indicate that the oligosaccharides result from polymerization of dextrose involving  $\alpha$  and  $\beta$  glucosidic linkages on different carbon atoms.

#### EDIBLE SPREADS OF WIDE PLASTIC RANGE FROM VEGETABLE OILS AND MONOGLYCERIDES.

Edwin P. Jones, Herbert J. Dutton, and John C. Cowan.

Jour. Amer. Oil Chem. Soc. 30(12): 609-610. December 1953.

A problem of the Quartermaster Food and Container Institute for the Armed Forces to which attention has been invited is the development of a spread for bread which will be plastic at the low temperatures of the Arctic regions and yet not melt or separate in the tropics. Compositions of our "Global Edible Spread" appear to meet these divergent requirements. Vegetable oils, saturated monoglycerides, butter yellow, flavor, salt, antioxidants, fat-soluble vitamins, and other nutritionally accepted ingredients comprise this spread. Since water is not present, separation of aqueous and fat phases does not occur. The product is spreadable at temperatures well below freezing and retains its form at temperatures in excess of 110° F.

#### SEQUESTRATION BY SUGAR ACIDS.

C. L. Mehlretter, B. H. Alexander, and C. E. Rist.

Indus. and Engin. Chem. 45(12): 2782-2784. December 1953.

The sequestering capacities of a number of sugar acids for calcium, ferric and cupric ions were determined in acid, neutral and alkaline solutions. In general, maximum sequestration was obtained in aqueous media containing from 2 to 5 percent sodium hydroxide. The relatively high efficiency of potassium acid saccharate for binding calcium and ferric ions in such solutions suggests its use in various commercial operations. An attempt was made to correlate structure of the sugar acids with sequestering ability.

#### \*U. S. DEPARTMENT OF AGRICULTURE LIBRARY - PEORIA BRANCH

Nellie G. Larson.

Illinois Libraries 35(10): 452-454. December 1953.

The organization, operation, and functions of Peoria Branch Library are described. The character of its book collections and the services it gives are determined by the type of research work performed at the Northern Laboratory.

#### ISOMALTOSE AND ISOMALTOTRIOSE FROM ENZYMIC HYDROLYZATES OF DEXTRAN.

Allene Jeanes, C. A. Wilham, R. W. Jones, H. M. Tsuchiya, and C. E. Rist.

Jour. Amer. Chem. Soc. 75(23): 5911-5915. December 5, 1953.

Isomaltose (6-[ $\alpha$ -D-glucopyranosyl]-D-glucose), and a new sugar which appears to be isomaltotriose (6-[ $\alpha$ -isomaltopyranosyl]-D-glucose), were prepared in yields of 50 percent and 20 percent, respectively, from enzymic hydrolyzates of the dextran from *Leuconostoc mesenteroides* NRRL B-512. The dextran was hydrolyzed by culture filtrates from *Penicillium funiculosum*, NRRL strains 1768 and 1132 which had been cultured on a medium containing B-512 dextran. Characterizing data are given for the amorphous sugars and their acetates. Reaction of the sugars with sodium metaperiodate showed that they were composed of aldopyranosidic units linked 1,6. Reaction of the sugar acetates with hydrogen bromide-acetic acid-acetyl bromide was typical of glucopyranosidic units linked  $\alpha$ -1,6.



# \*THE CHEMICAL SYNTHESIS OF D-GLUCURONIC ACID.

C. L. Mehlretter.

Pages 231-249 of book entitled "Advances in Carbohydrate Chemistry," Vol. VIII, Academic Press, New York. 1953.

The various procedures for the chemical syntheses of D-glucuronic acid, from the original method of Emil Fischer in 1891 through the present time, have been reviewed. Comparison is made of both oxidative and reductive reactions. The more practical synthesis of D-glucuronic acid to 1,2-isopropylidene-D-glucuronic acid by means of catalytic oxidation of 1,2-isopropylidene-D-glucose, with yields of 50-60 percent of theory, is described in detail. By simple hydrolysis the 1,2-isopropylidene-D-glucuronic acid is converted to D-glucuronic acid in nearly quantitative yield.

## REPUBLICATIONS

### PULP AND PAPER RESEARCH AT THE NORTHERN REGIONAL RESEARCH LABORATORY.

S. I. Aronovsky and E. C. Lathrop

Indian Pulp and Paper 8(1) 51-55. July 1953.

La Papeterie 75(8) 525-527, 529, 531, 533. August 1953.

O Papel XVII. 17-22. November 1953

Cellulosa E Carta 4(12). 5-9. December 1953.

[Previously published in Paper Mill News 75(38) 92, 94, 96, 126. September 20, 1952.]

## CONTRACT RESEARCH PUBLICATIONS

(Report of research work done by outside agencies under contract with the U. S. Department of Agriculture and supervised by the Northern Regional Research Laboratory of the Bureau of Agricultural and Industrial Chemistry.)

### VOLATILE DECOMPOSITION PRODUCTS OF THE OXIDATIVE POLYMERS OF ETHYL LINOLENATE.

Ogden C. Johnson, S. S. Chang, and F. A. Kummerow.

Jour. Amer. Oil Chem. Soc. 30(8) 317-320. August 1953.

### FLAVOR REVERSION IN SOYBEAN OIL. VII AUTOXIDATION OF ISOLINOLEIC ACID.

J. B. Harrison and B. F. Daubert.

Jour. Amer. Oil Chem. Soc. 30(9) 371-375. September 1953.

## PATENTS

[ These patents are assigned to the Secretary of Agriculture. Copies of patents  
may be purchased from the U. S. Patent Office, Washington, D. C. ]

### METHOD OF MAKING LIGNOCELLULOSE PRESSURE MOLDED ARTICLE.

Robert V. Williamson.

U. S. Patent 2,645,587. July 14, 1953.

Agricultural residues are mixed with a minor amount of thermoplastic resin such as resin, Vinsol, etc., and thermally treated to make a molding composition. The molded products are hard, strong, and highly water resistant.

### STABILIZATION OF GLYCERIDE OILS WITH OXYDIALKANOIC ACIDS.

Cyril D. Evans, John C. Cowan, and Arthur W. Schwab.

U. S. Patent 2,645,648. July 14, 1953.

The oxidative stability of glyceride oils, such as soybean oil, is increased by the addition of small amounts of oxydialkanoic acids.

### ELECTROLYTIC PREPARATION OF PERIODATE OXYPOLYSACCHARIDES.

William Dvornch and Charles L. Mehlretter.

U. S. Patent 2,648,629. August 11, 1953.

Polysaccharides, such as starch or cellulose, are oxidized with periodic acid in the presence of a means for electrically regenerating the periodic acid as soon as it becomes reduced.

### ALKYL ACYLOXY STEARATES.

Howard M. Teeter and John C. Cowan.

U. S. Patent 2,652,411. September 15, 1953.

Certain alkyl acyloxy stearates are prepared by forming the ester of hydroxy stearic acid with a branch-chain aliphatic alcohol and then esterifying the hydroxyl group with an aliphatic acylating agent. Those compounds which contain the acyloxy group near the mid-portion of the stearyl chain are suitable as lubricants. Of these compounds, those formed from alcohols containing more than 5 carbon atoms (2-ethylhexyl) are especially useful as low-temperature lubricants.

### CONTINUOUS EXTRACTION OF OIL FROM VEGETABLE MATERIALS.

Richard H. Westergaard.

U. S. Patent 2,653,957. September 29, 1953.

The recycle alcohol or the hot miscella of an alcohol extraction of oilseeds is purified and valuable byproducts recovered by alkaline treatment.

### PROCESS OF PRODUCING AMYLOSE FILMS.

Howard A. Davis, Ivan A. Wolff and James E. Cluskey.

U. S. Patent 2,656,571. October 27, 1953.

Amylose or mixtures of starchy materials containing at least half amylose are treated with complexing agents and the solutions cast or sprayed to form transparent films of good strength.

#### PRODUCTION OF ITACONIC ACID.

Virgil F. Pfeifer, George E. N. Nelson, Charles Vojnovich, and Lewis B. Lockwood.  
U. S. Patent 2,657,173. October 27, 1953.

Itaconic acid, useful in plastics manufacture, is produced by fermentation with *Aspergillus* mold in high yields and reduced time by using a limited amount of glucose as the carbohydrate nutrient. A nutrient medium containing about 6 percent glucose at a pH of about 4.8 produces 85 to 90 percent of theoretical yield in a 3-day submerged and aerated fermentation.

#### HYDROGENATION DERIVATIVES OF DIFURFURALACETONE.

Kliem Alexander and Lester E. Schniepp.  
U. S. Patent 2,657,220. October 27, 1953.

A series of hydroxylated derivatives, useful as intermediates in organic chemistry, are produced by hydrogenating difurfuralacetone to various degrees. Difurfuralacetone and a hydrogenation catalyst are treated under pressure with gaseous hydrogen to give, depending on the degree of hydrogenation, 2-( $\beta$ -furylethyl)-1,6-dioxaspiro-[4.4] nonane; 2-( $\beta$ -tetrahydrofurylethyl)-1,6-dioxaspiro-[4.4] nonane; 1-tetrahydrofuryl-3,6,9-nonanetriol; and 1,4,7,10,13-tridecanepentaol.

#### METHOD FOR THE PRODUCTION OF DEXTRAN OF RELATIVELY LOW MOLECULAR WEIGHT.

Harold J. Koepsell, Henry M. Tsuchiya, and Nison N. Hellman.  
U. S. Patent 2,660,551. November 24, 1953.

Dextran of a relatively low molecular weight is synthesized enzymatically by means of dextransucrase, using high concentrations of sucrose which may vary from 25 to 75 g. per 100 ml. of solution. In the higher ranges of concentration, the low-molecular-weight dextran is the predominating product. It can be recovered from the reaction mixture, and incidentally separated from high-molecular-weight dextran by precipitation with alcohol.

#### STABILIZATION OF GLYCERIDE OILS.

Arthur W. Schwab, Cyril D. Evans, and Patricia M. Cooney.  
U. S. Patent 2,661,358. December 1, 1953.

The oxidative stability of glyceride oils, such as soybean oil, is increased by the addition of small amounts of chelidonic or chelidamic acid.

#### GLUCONAMIDES.

Charles L. Mehlretter and John C. Rankin.  
U. S. Patent 2,662,073. December 8, 1953.

A chemical compound derived from glucose, D-gluconolactone, is reacted with primary aliphatic amines to give a new class of surface-active agents.

#### STABILIZATION OF GLYCERIDE OILS WITH CARBOXYMETHYL MERCAPTOSUCCINIC ACID.

Arthur W. Schwab, Patricia M. Cooney, and Cyril D. Evans.  
U. S. Patent 2,662,905. December 15, 1953.

The oxidative stability of glyceride oils, such as soybean oil, is increased by the addition of small amounts of carboxymethyl mercaptosuccinic acid.



